

Missouri: The “Spring State”

By: Loring Bullard

With over 5,000 named caves, Missouri has been nicknamed “The Cave State.” However, it could just as appropriately be called “The Spring State.” For where there are caves, there are, or at least once were, springs. Springs, in fact, give rise to caves. Both are features of karst terrain, a porous landscape that can form where limestone and dolomite bedrock predominate. Weakly acidic, downward percolating rainwater dissolves and widens openings in these rocks, eventually producing flowing spring systems. Springs are more than curiosities. They are a karst region’s lifeblood.

Springs are of historic as well as scientific interest. Their geographic distribution profoundly impacted the state’s settlement, an influence illustrated by the fact that at least sixty-five Missouri communities have the word “spring” in their names. Springs served as the first public water supplies for many cities and towns, including Aurora, Bolivar, Mt. Vernon, Neosho, Ozark, Palmyra, Pierce City, Springfield, Sullivan, Warrensburg and Webb City. Springfield is rather unique among cities in that it still uses a spring for a significant portion of its water supply.

Springs generated and sustained a variety of commercial and industrial enterprises—serving as refrigerators for dairies; furnishing cheap, reliable power for mills; water supplies for tanneries, canneries and pickling operations; process water for factories; and boiler water for steam locomotives. Spring settings became focal points for community gatherings—picnic sites, swimming holes, fishing camps and in some cases, pleasure parks. This legacy of springs as social centers survives today in the numerous city parks in Missouri with springs as centerpieces.

Springs have always attracted life, human and otherwise. The remains of ancient creatures like ground sloths, muskox and mastodons have been discovered in the bottom muck of Missouri springs. Archaeologists also find a large number of prehistoric human habitation sites near perennial springs. Native Americans and westward migrating settlers followed the trend, establishing hunting camps and villages near productive springs.

A variety of aquatic ecosystems are supported by springs. Many Ozark creeks would be bone-dry for much of the year without their feeder springs. Interesting and unique animals and plants inhabit these cool, clear waters, both above and below ground. Some, like mottled sculpins and watercress, thrive in the constant cold temperature found near the spring mouth, while others find a more comfortable home downstream, where spring waters join and mix with streams. Underground, spring water sustains a suite of highly adapted creatures, such as white, unpigmented cave salamanders and blind Ozark Cavefish. This subterranean life is utterly dependent upon nutrients brought in from the surface.

Given their impressive histories, cultural prominence and biological significance, one might expect springs to be treated with respect, perhaps even reverence. In some ways,

however, they have become neglected resources, “orphans” of the aquatic realm. Although environmental laws, such as those governing septic tanks, underground storage tanks and landfill construction, are intended to protect the deeper groundwater, our primary drinking water supply—it is the shallow groundwater, the plumbing systems of springs, which is the most easily compromised by surface pollution.

The nature of spring systems renders them highly susceptible to pollution. Fissures and tubes in karst bedrock act like arterial highways, moving water and its load of dissolved and suspended materials rapidly into and through the subsurface. This effect is heightened by surface features such as sinkholes and losing streams (streams that leak flow into the subsurface), which funnel water directly into the spring’s plumbing system. A septic tank or leaking underground storage tank near this open flow network can easily pollute a spring. Or, as occasionally happens in Missouri, a pipeline break in the watershed of a losing stream can, within a matter of hours, contaminate a spring many miles away. Nowhere is this surface-subsurface water connection felt more strongly than in karst terrain.

In spite of the vulnerability of springs, we largely ignore the quality of the water emerging from them. Unless a spring becomes grossly polluted or fish die, we barely notice. These days, few towns or households use springs for water supplies, a practice discouraged by health departments because springs are so easily polluted. While this shunning of springs as drinking water sources may be prudent for public health, at the same time it inadvertently diminishes the constituency advocating their protection.

Recognizing the serious nature of this neglect, the Watershed Committee of the Ozarks, in partnership with City Utilities of Springfield and the Greene County Resource Management Department, began the Adopt-A-Spring program in 1999. Through Adopt-A-Spring, trained volunteers routinely sample an assortment of springs, large and small, in both rural and urban settings, throughout Greene County.

With a few years’ worth of data in hand, some trends have come to light. Springs in urban settings commonly exhibit low levels of organic chemical contamination and both urban and rural springs frequently contain high levels of *E.coli* bacteria. Adopt-A-Spring data clearly demonstrate that spring quality reflects man’s activities on the land; and reinforce the notion of springs as barometers of groundwater quality and early warning systems for our deeper groundwater supplies.

Springs, in large measure, define the Missouri Ozark landscape. More than evoking awe and wonder, they serve important functions—replenishing water supplies and sustaining life above and below ground. These services are valuable to mankind. For this reason, we need to make a concerted effort to lighten our footprint on karst lands, so that these interesting and essential features of our natural world can continue to refresh and inspire future generations of Missourians.

(An edited version of the article originally appeared in an issue of Missouri Conservationist.)

